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CURRENT INDUSTRIAL REPORTS

Titanium Ingot, Mill Products, and Castings

U.S. Department of Commerce
BUREAU OF THE CENSUS
BUREAU OF INDUSTRIAL ECONOMICS

SUMMARY FOR 1981

ITA-991(81)-13
Issued April 1983

SUMMARY OF FINDINGS

The total production of titanium ingot for 1981 was 92.0 million pounds. This represented a 7-percent increase in production from 85.7 million pounds produced in 1980. Consumption of titanium ingot increased 1 percent from 86.7 million pounds in 1980 to 87.2 million pounds in 1981. Net shipments of mill products decreased by 6 percent from 54.3 million pounds in 1980 to 51.0 million pounds in 1981. Castings shipments increased 9 percent from 382.4 million pounds in 1980 to 417.4 million pounds in 1981.

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Table 1. TITANIUM INGOT PRODUCTION, RECEIPTS, SHIPMENTS, CONSUMPTION, AND ENDING INVENTORIES: 1981

(Quantities in thousands of pounds)

Month and year	Production	Receipts	Shipments	Consumption	Ending inventories
Total[1]	92,471	24,155	20,352	87,184	(X)
January	8,056	2,113	1,550	8,892	3,779
February	7,202	1,901	1,696	6,740	4,753
March	8,304	1,935	2,277	8,261	3,584
April	8,798	1,920	2,151	7,609	4,879
May	7,493	2,016	1,774	6,729	5,268
June	7,478	1,943	1,769	7,088	4,616
July	6,712	1,745	1,712	4,480	4,021
August	8,409	1,470	1,135	8,940	4,972
September	8,208	2,536	1,980	7,686	5,580
October	8,029	2,937	1,945	7,855	6,577
November	6,245	1,882	1,303	6,043	6,412
December	7,537	1,757	1,060	6,861	7,184

(X) Not applicable.

[1] Total inventory figures are those shown for December.

Address inquiries concerning these figures to the U.S. Department of Commerce, Bureau of Industrial Economics, Office of Basic Industries, Washington, D.C., 20230, or to the Bureau of the Census, Industry Division, Washington, D.C. 20233, or call Nathaniel A. Shelton, (301) 763-2529.
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Table 2. TITANIUM MILL PRODUCTS AND CASTINGS: 1981

(Quantities in thousands of pounds)

Product	Total	January	February	March	April	May	June	July	August	September	October	November	December
Mill products:													
Production	58,944	3,898	5,384	5,422	5,191	5,517	4,810	4,916	4,748	5,167	5,116	4,287	4,488
Sheet and strip	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate													
Forging and extrusion billet	31,168	1,566	2,994	2,913	2,432	3,026	2,155	2,866	2,615	2,865	2,873	2,282	2,581
Rod and bar	8,053	866	744	745	776	789	722	549	566	635	512	645	504
Fastener stock and wire	1,024	159	142	130	89	80	77	55	70	49	47	62	64
Extrusions (other than tubing)	[1]18,699	[1]1,307	[1]1,504	[1]1,634	[1]1,894	[1]1,622	[1]1,856	[1]1,446	[1]1,497	[1]1,618	[1]1,684	[1]1,298	[1]1,339
Pipe and tubing													
Other													
Receipts	9,083	792	849	868	413	882	677	802	840	631	720	847	762
Sheet and strip	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate													
Forging and extrusion billet	7,916	689	742	745	325	782	546	706	742	540	626	793	680
Rod and bar	-	-	-	-	-	-	-	-	-	-	-	-	-
Fastener stock and wire	-	-	-	-	-	-	-	-	-	-	-	-	-
Extrusions (other than tubing)	[1]1,167	[1]103	[1]107	[1]123	[1]88	[1]100	[1]131	[1]96	[1]98	[1]91	[1]94	[1]54	[1]82
Pipe and tubing													
Other													
Net shipments[2]	50,985	3,678	4,444	4,916	5,130	4,477	4,804	3,745	3,833	4,619	4,322	3,278	3,739
Sheet and strip	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate													
Forging and extrusion billet	27,494	1,348	2,684	2,712	2,561	2,429	2,360	1,994	2,127	2,517	2,460	1,947	2,355
Rod and bar	7,157	840	686	724	772	789	730	539	492	635	522	632	496
Fastener stock and wire	1,253	167	162	168	104	99	111	69	91	56	60	87	79
Extrusions (other than tubing)	[1]18,194	[1]1,424	[1]1,436	[1]1,621	[1]1,901	[1]1,523	[1]1,732	[1]1,360	[1]1,353	[1]1,638	[1]1,760	[1]1,171	[1]1,275
Pipe and tubing													
Other													
Castings:													
Production[3]	674	51	45	51	55	53	65	66	59	60	44	49	76
Shipments	419	38	29	35	27	37	38	38	33	33	32	37	42

- Represents zero.

[1] Data for sheet and strip, plate, extrusions (other than tubing), and pipe and tubing have been combined to avoid disclosing individual company data.

[2] Net shipments, total, is the sum of mill products shipments plus mill products consumed in the manufacture of fabricated products, less total receipts. Net shipments for each mill product category also includes the consumption of mill products in that category in the manufacture of other mill products. Detail does not add to total because of this difference in definition.

[3] Includes gross weight of castings before machining.

Table 3. TITANIUM INGOT, MILL PRODUCTS, AND CASTING: 1980

(Thousands of pounds)

Product	Total	January	February	March	April	May	June	July	August	September	October	November	December
Ingot:													
Production	85,729	7,029	6,621	7,794	6,727	7,057	8,029	6,103	7,132	7,806	5,976	7,133	8,322
Consumption	86,721	7,276	6,790	7,950	6,891	6,573	7,835	6,368	5,832	8,341	8,015	[r]7,386	7,464
Stocks, end of period	(X)	4,356	4,346	4,144	4,038	4,706	4,705	4,942	5,850	4,945	3,343	[r]3,203	3,719
Mill products--net shipments[1]	54,266	3,987	4,777	5,256	5,006	4,544	4,760	3,881	3,895	4,889	4,621	3,929	4,721
Sheet and strip	11,869	936	986	1,023	1,042	820	1,113	828	1,009	1,211	1,103	769	1,029
Plate													
Forging and extrusion billet	25,882	1,917	2,221	2,512	2,410	2,239	2,229	2,091	1,738	1,895	2,226	2,148	2,256
Rod and bar	8,472	627	718	724	792	706	751	564	596	853	666	487	988
Fastener stock and wire	2,303	187	186	203	195	176	199	152	205	199	233	198	170
Extrusions (other than tubing)	5,740	320	666	794	567	603	468	246	347	731	393	327	278
Pipe and tubing													
Other													

[r] Revised by 5 percent or more from previously published data. (X) Not applicable.

[1] Net shipments are derived by subtracting the sum of producers' receipts of each mill shape from the industry's gross shipments of that shape. Gross shipments include the quantities of mill shapes consumed in rolling mills in the production of fabricated products such as forgings, etc. Also includes the quantities shipped between producers and customers.

Table 4. SHIPMENTS, EXPORTS, IMPORTS, AND APPARENT CONSUMPTION OF TITANIUM INGOT, MILL PRODUCTS, AND CASTINGS: 1981

(Quantity in thousand of pounds; value in thousands of dollars)

Month and year	Manufacturers' net shipments (quantity)	Exports of domestic merchandise[1] [2]			Percent exports to manufacturers' net shipments (quantity)	Imports for consumption[1] [4]		Apparent consumption[6] (quantity)	Percent imports to apparent consumption (quantity)
		Quantity	Value at port	Estimated producers value[3]		Quantity	Value[5]		
TOTAL									
Total	74,873	12,098	159,454	155,165	16	2,719	27,234	65,496	4
Titanium ingot and forging and extrusion billet[7]	47,513	8,405	105,647	102,805	18	488	5,221	39,598	1
Titanium mill products	27,360	3,693	53,807	52,360	13	2,231	22,013	25,898	9
DECEMBER									
Total	5,265	957	14,087	13,708	18	119	1,264	4,427	3
Titanium ingot and forging and extrusion billet[7]	3,415	778	10,842	10,550	22	40	382	2,677	1
Titanium mill products	1,850	179	3,245	3,158	10	79	882	1,750	5
NOVEMBER									
Total	5,197	1,581	17,756	17,278	30	339	3,484	3,955	9
Titanium ingot and forging and extrusion billet[7]	3,250	828	10,335	10,057	25	132	1,007	2,554	5
Titanium mill products	1,947	753	7,421	7,221	38	207	2,477	1,401	15
OCTOBER									
Total	6,804	805	11,876	11,557	12	208	1,537	6,207	3
Titanium ingot and forging and extrusion billet[7]	4,462	628	9,072	8,828	14	8	115	3,842	(Z)
Titanium mill products	2,342	177	2,804	2,729	8	200	1,421	2,365	3
SEPTEMBER									
Total	6,436	914	11,591	11,279	14	140	1,509	5,662	2
Titanium ingot and forging and extrusion billet[7]	4,107	586	8,004	7,789	14	4	78	3,525	(Z)
Titanium mill products	2,329	328	3,587	3,491	14	136	1,431	2,137	6
AUGUST									
Total	5,198	969	10,443	10,162	19	423	3,664	4,535	9
Titanium ingot and forging and extrusion billet[7]	3,262	763	7,335	7,138	23	87	756	2,586	3
Titanium mill products	1,936	206	3,108	3,024	11	336	2,908	1,949	11
JULY									
Total	5,674	1,012	14,214	13,832	18	206	2,273	4,988	4
Titanium ingot and forging and extrusion billet[7]	3,706	726	10,100	9,828	20	53	598	3,033	2
Titanium mill products	1,968	286	4,114	4,003	15	153	1,675	1,955	16
JUNE									
Total	6,702	895	13,414	13,053	13	167	2,197	5,974	3
Titanium ingot and forging and extrusion billet[7]	4,129	626	8,269	8,037	15	21	285	3,524	1
Titanium mill products	2,573	269	5,155	5,016	10	146	1,912	2,450	6
MAY									
Total	6,613	973	15,356	14,943	15	258	2,684	5,898	4
Titanium ingot and forging and extrusion billet[7]	4,203	772	10,754	10,465	18	86	1,087	3,517	2
Titanium mill products	2,410	201	4,602	4,478	8	172	1,597	2,381	7
APRIL									
Total	7,489	978	14,423	14,035	13	247	1,462	6,758	4
Titanium ingot and forging and extrusion billet[7]	4,712	714	9,378	9,126	15	12	204	4,010	(Z)
Titanium mill products	2,777	264	5,045	4,909	10	235	1,258	2,748	9
MARCH									
Total	7,502	927	11,764	11,448	12	330	4,239	6,905	5
Titanium ingot and forging and extrusion billet[7]	4,989	757	7,882	7,670	15	14	244	4,246	(Z)
Titanium mill products	2,513	170	3,882	3,778	7	316	3,995	2,659	12
FEBRUARY									
Total	6,664	1,216	13,560	13,195	18	172	1,451	5,620	3
Titanium ingot and forging and extrusion billet[7]	4,380	726	7,376	7,177	17	9	131	3,663	(Z)
Titanium mill products	2,284	490	6,184	6,018	21	163	1,320	1,957	8
JANUARY									
Total	5,329	870	10,969	10,674	16	110	1,471	4,569	2
Titanium ingot and forging and extrusion billet[7]	2,898	500	6,310	6,140	17	23	334	2,421	1
Titanium mill products	2,431	370	4,659	4,534	15	87	1,137	2,148	4

(Z) Less than one-half of 1 percent.

[1] See table 6 for comparison of Standard Industrial Classification (SIC) codes, Schedule B export codes, and TSUSA import codes.

[2] Source: Bureau of the Census report FT-410, U.S. Exports--Schedule E--Commodity by Country.

[3] These values were derived by use of adjustment factors to exclude freight, insurance, and other charges incurred in moving goods to the port of export. This adjustment is made to convert the values to an approximation of the producers' value of exported goods. Current adjustment factors are based on data for 1980 which are published in Origin of Exports of Manufacturing Establishments, M80(AS)-6, appendix B. Comparable adjustment factors for earlier years are based on similar factors developed for 1971 and 1972. The current adjustment factor for this report is 0.9731.

[4] Source: Bureau of the Census report IM 145-X, U.S. Imports for Consumption and General Imports.

[5] The value includes c.i.f. (cost, insurance, and freight) at the first port of entry in the United States plus U.S. import duties and other charges to the import point.

[6] Apparent consumption is derived by subtracting exports from the total of net shipments plus imports.

[7] Comparability of output, export, and import classifications for ingot and billet assume that blown, sheet bar, and slab are reported as ingot on billet in the output codes. Figures for imports of ingot and billet also include powder, crystal, and similar forms which are excluded from the output and export codes.

Table 5. NET SHIPMENTS, EXPORTS, IMPORTS, AND APPARENT CONSUMPTION OF TITANIUM MILL PRODUCTS: 1980

(Quantity in thousands of pounds; value in thousands of dollars)

Month and year	Manufacturers' net shipments[1] (quantity)	Exports of domestic merchandise[1]			Percent exports to manufacturers' net shipments (quantity)	Imports for consumption[1] [4]		Apparent consumption[6] (quantity)	Percent imports to apparent consumption (quantity)
		Quantity[2]	Value at port[2]	Estimated producers' value[3]		Quantity	Value[5]		
Total	54,266	3,689	50,824	48,478	7	1,892	17,930	52,469	4
December	4,721	317	5,371	5,119	7	223	1,853	4,627	5
November	3,929	295	5,050	4,813	7	143	1,350	3,777	4
October	4,621	629	6,149	5,903	14	160	1,318	4,152	4
September	4,889	441	4,538	4,325	9	154	1,544	4,602	3
August	3,895	243	4,422	4,214	6	292	3,812	3,944	7
July	3,881	429	4,872	4,643	11	119	1,434	3,571	3
June	4,760	202	3,274	3,120	4	127	1,176	4,685	3
May	4,544	233	3,970	3,783	5	114	988	4,425	3
April	5,006	188	3,118	2,971	4	119	1,277	4,937	2
March	5,256	226	3,448	3,286	4	163	1,030	5,193	3
February	4,777	280	3,843	3,662	6	133	1,005	4,630	3
January	3,987	206	2,769	2,639	5	145	1,143	3,926	4

See footnotes at the end of table 4.

Table 6. COMPARISON OF STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES, SCHEDULE B EXPORT CODES, AND TSUSA IMPORT CODES: 1980

SIC-based product code	Description	Export code	Description	Import code	Description
33562 74[1]	Titanium ingot and forging and extrusion billet	630.6520	Titanium ingots, billets, blooms sheetbar, and slabs	629.1460	Unwrought titanium metal, except sponge
33562 79	Titanium mill products	630.6570	Wrought titanium metal including alloys (excludes, sponge ingots, billets brooms, sheet bars, slabs, waste and scrap)	629.2000	Wrought titanium metal, including alloys (excludes waste, scrap, and unwrought metal

[1] Comparability of output, export, and import classification for ingot and billet assume that bloom, sheet bar, and slab are reported as ingot or billet in the output codes.

[2] Figures for imports of ingot and billet also include powder crystals and similar primary forms which are excluded from the output and export codes.

DESCRIPTION OF SURVEY

Scope of Survey—This survey covers companies engaged in producing titanium ingot, mill products, and castings.

Survey Methodology—The statistics in this publication are collected by mail on Bureau of the Census monthly Form ITA-991, Titanium Metal. The panel for this survey includes all known producers of titanium ingot, mill products, and castings, approximately 30 companies.

Survey Error—Figures for the current month include estimates for panel members for which reports were not received in time for tabulation. Such missing figures are "imputed" based on month-to-month movements shown by reporting firms. Imputation generally is limited to a maximum of 10 percent for any one data cell. Figures with imputation rates greater than 10 percent are footnoted.

The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse because the actual monthly movements for nonrespondents may or may not closely agree with the imputed movements. The probable range of difference between the actual and imputed figures is not precisely known but is assumed to be small. The degree of uncertainty regarding the accuracy of the published data increase as the percentage of imputation increases. Figures with imputation rates above 10 percent should be used with caution.

Revision to Previous Period Data—Data may be revised as the result of corrected figures received from respondents or other corrections. Figures which have been revised by more than 5 percent from previously published figures are indicated by footnotes.

EXPLANATION OF TERMS

Gross Shipments of Mill Products—Represents mill shapes between producers plus mill shapes consumed in the production of fabricated products such as forgings.

Net Shipments of Mill Products—Represents gross shipments less receipts. For detail categories, net shipments also includes consumption in the manufacture of other mill shapes.

COMPARISON OF EXPORT, IMPORT, AND DOMESTIC OUTPUT DATA

The Standard Industrial Classification (SIC) system used for domestic output and the statistical export and import commodity classifications were developed independently and are based on somewhat differing systems of classification. This results in considerable difficulty in comparing the three types of data for many commodity areas. The domestic output classification is based on type of industry; on the other hand, the export and import classification system is more materials oriented. Aside from the differences in the basic commodity classifications, there are additional problems involving import data, since there are a substantial number of imported commodities which are not produced in the United States or which are produced only in very small quantities and which, therefore, have no comparable domestic output classification. The relationships shown in this report should be considered only as approximations, since, in addition to the problems mentioned above, there are also the following problems affecting the comparability of the three sets of data.

Valuation—There are different methods of valuation for the three types of data:

> *Domestic Output*—Valued at the point of production. It includes the net sales price, f.o.b. plant, after discounts and allowances, exclusive of freight charges and excise taxes.
>
> *Exports*—Valued at the point of exportation. It includes the selling price, or cost if not sold, and inland freight, insurance, and other charges to the export point.
>
> Estimated producers' values of exports have also been developed. These values more closely approximate the values reported for domestic output because they exclude freight, insurance, and other charges applied from the producing plant to the export point.
>
> *Imports*—Valued at the first port of entry in the United States. It includes c.i.f. (cost, insurance, and freight), duty, and other charges to the import point.

Duplication in Quantity and Value of Output—Because producers' shipments of some commodities may be used as materials for incorporation into other commodities, combinations of data for such commodities may contain a certain amount of duplication. Thus, percentages of exports to output or imports to apparent consumption (output plus imports minus exports) at four-digit or broader levels may be understated. Where duplication is known to be substantial, the output data are appropriately noted in the table.

Estimated Low-Valued Export and Import Transactions—The import statistics include estimated value data for shipments valued under $251, based on a 1-percent sample. Effective with the statistics for March 1979, the lower limit of the value ranges for estimating data for low-value export shipments has been raised from $251 to $501. For countries other than Canada, effective with the March 1979 statistics, data for shipments valued $501-$999 (formerly $251-$999) are estimated based on a 50-percent sample of such shipments. As in the past, these estimates are combined with data for shipments valued $1,000 and over, which continue to be fully compiled. For Canada, effective with the March 1979 statistics, shipments valued $501-$1,999 ($251-$1,999 prior to March 1979) are estimated, based on a 10-percent sample and are combined with fully compiled data for shipments valued $2,000 and over. For exports to all countries, data for shipments valued under $501 (under $251 prior to March 1979) are also estimated, based on established percentages of individual country totals.

Manufacturers' Shipments, Not Specified by Kind—The value of manufacturers' shipments at the four-digit industry level often includes a small amount which is not distributed among the individual five-digit product classes. Export and import percentages at the more detailed levels might, therefore, be slightly overstated.

Time Lag Between Output and Exports—There will be a lag between the time a commodity is produced or shipped by the producer and the time it is actually exported, especially when intermediaries (wholesalers, exporters, etc.) are involved. Ordinarily, this type of discrepancy is insignificant in annual figures.

"Direct" vs "Total" Commodity Exports and Imports—Export and import data do not include materials which are incorporated into other more finished products and exported or imported in finished form. Thus, by showing only direct exports and imports, the relation of exports to output and imports to apparent consumption for intermediate products is considerably understated.

Used Commodities—With a few exceptions, used or rebuilt commodities are classified in the same import or export codes as is new merchandise. Percentages are thus overstated to the extent that used or rebuilt products are significant in trade.

Geographic Area of Coverage—Import and export data reflect the movement of merchandise into and out of the U.S. customs territory (the 50 States, the District of Columbia, and Puerto Rico). They do not include movements between the United States and its possessions. Domestic output (shipments) data exclude Puerto Rico and other outlying areas.

HISTORICAL NOTE

Data on titanium metal have been collected by the Bureau of the Census since 1955. Historical data may be obtained from Current Industrial Reports (called Facts for Industry before 1959) available at your local Federal Depository Library. A list of these libraries may be obtained from the Bureau of the Census regional offices:

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CONTACTS FOR DATA USERS

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Foreign Trade publication	Juanita Noone	(301) 763-5140
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